
Intel
Developer
Forum
Spring 2002
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Intel in Communications

Sean Maloney
Executive Vice President
General Manager
Intel Communications Group

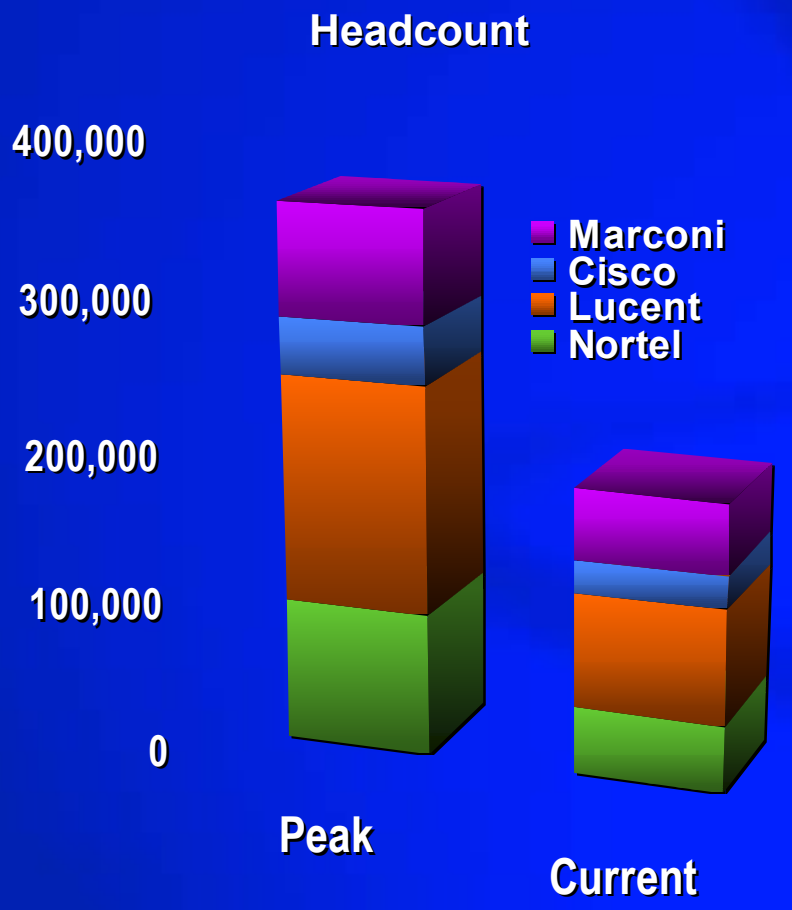
VIDEO

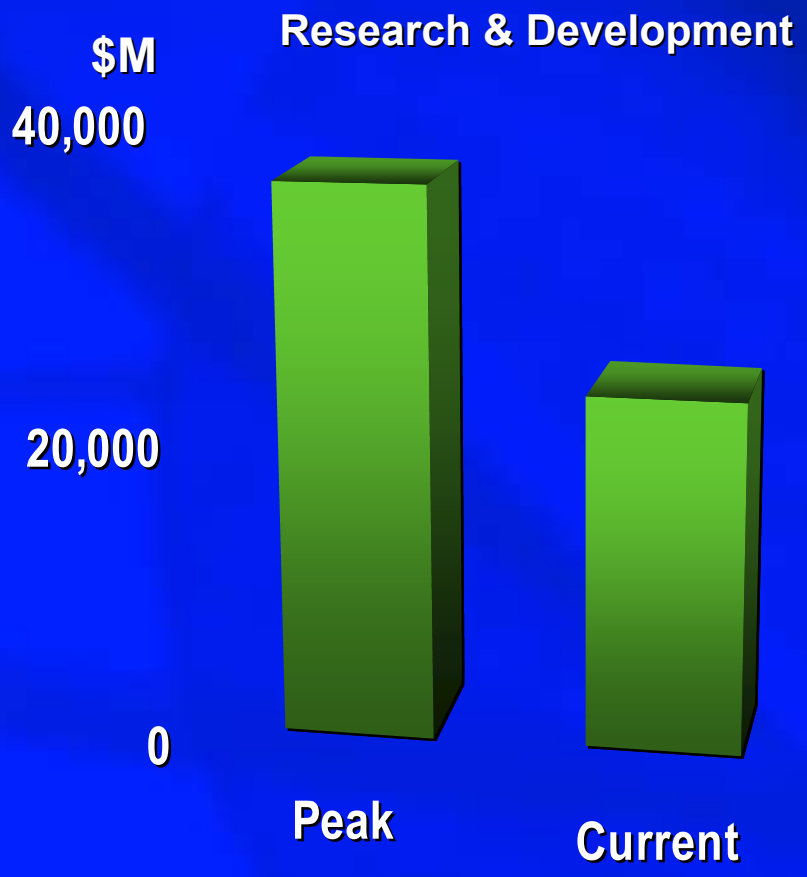
Agenda

- Today's Environment
- The Need for Speed: Ethernet and Optical
- Processing in the Network

10 Year's Changes in One Year

Telecom Equipment Manufacturers



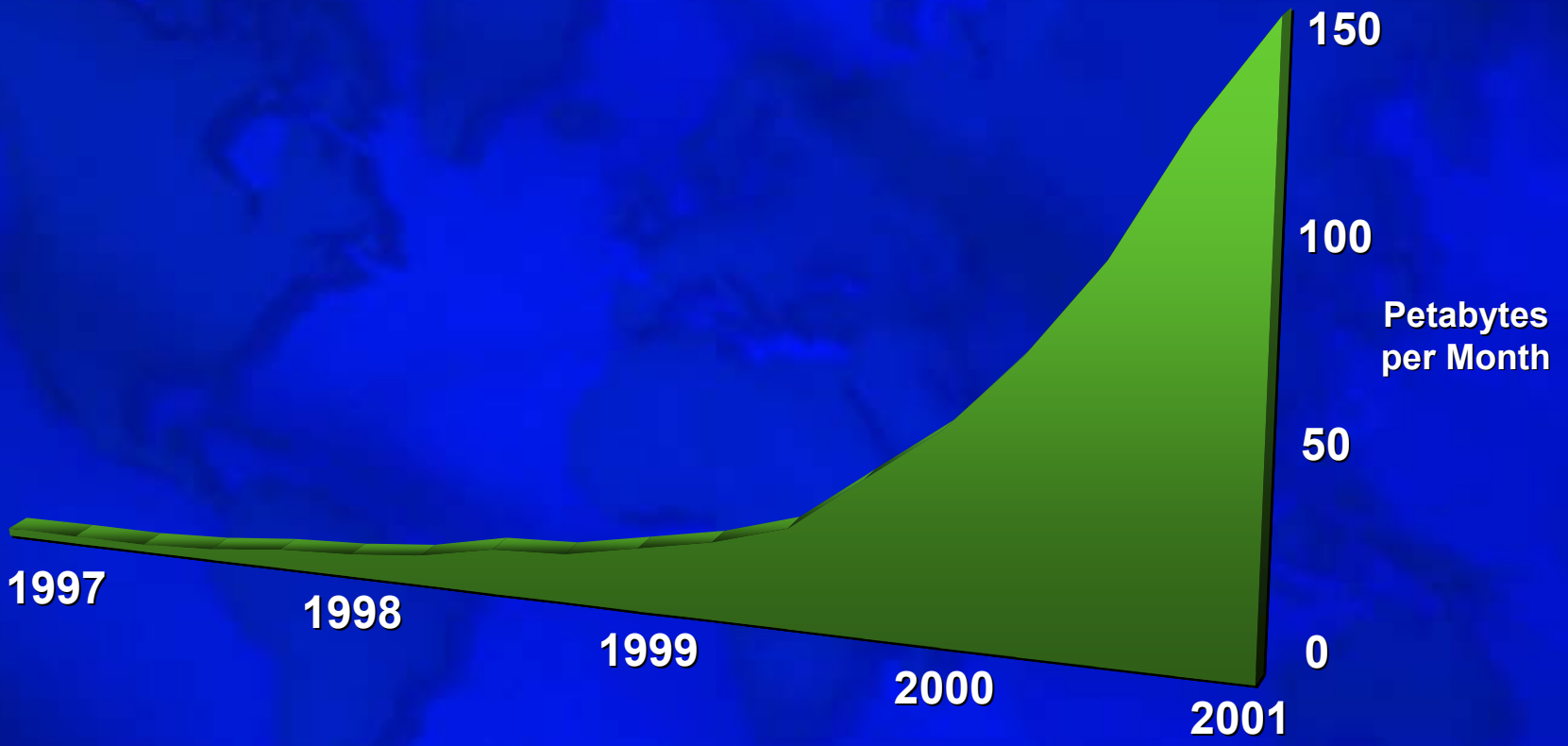


Source: Thomson Financial, Working People.com, ITWorld.com, Light Reading

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Good News...

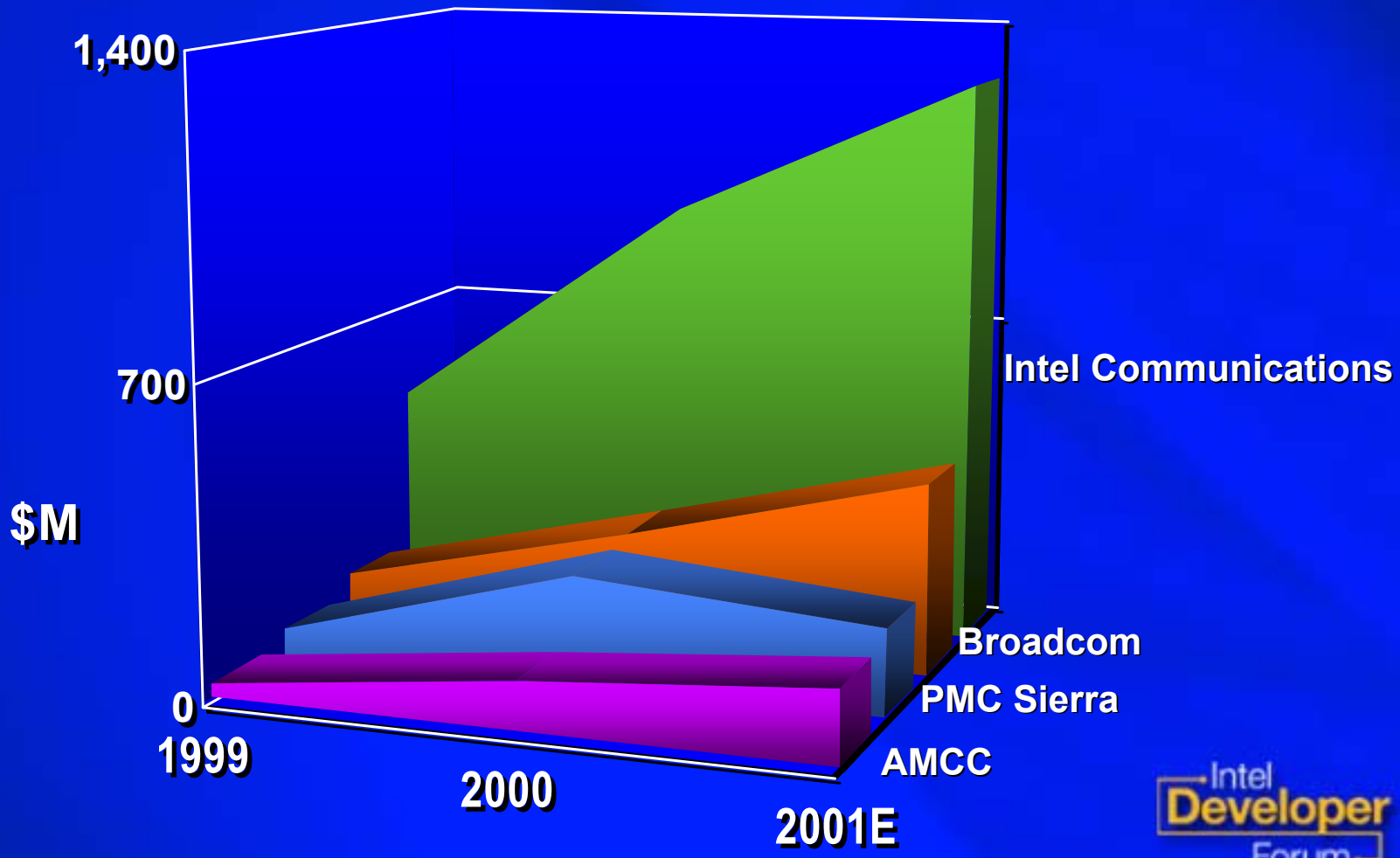
Worldwide Internet Traffic



Sources: RHK, December 2001

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Technology Leadership
Communications R&D Spending



Sources: SEC and Edgar Filings, Worldscope

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Standards Influence

























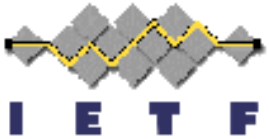






















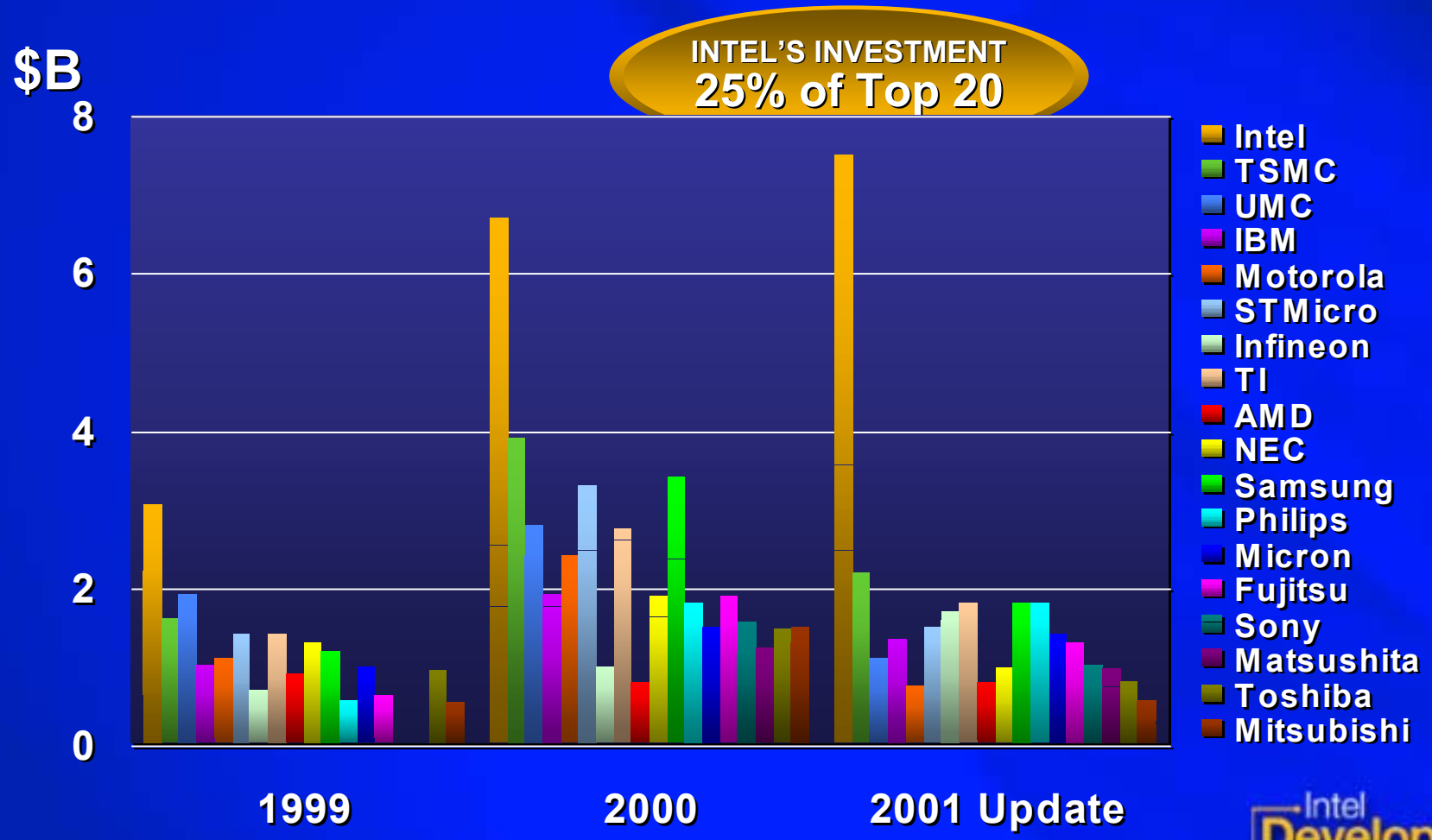






* Third party brands/names are property of their respective owners

Top 20 Semiconductor Capital Spenders 2001



Source: Company news, Dataquest, VLSIR

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The Need for Speed

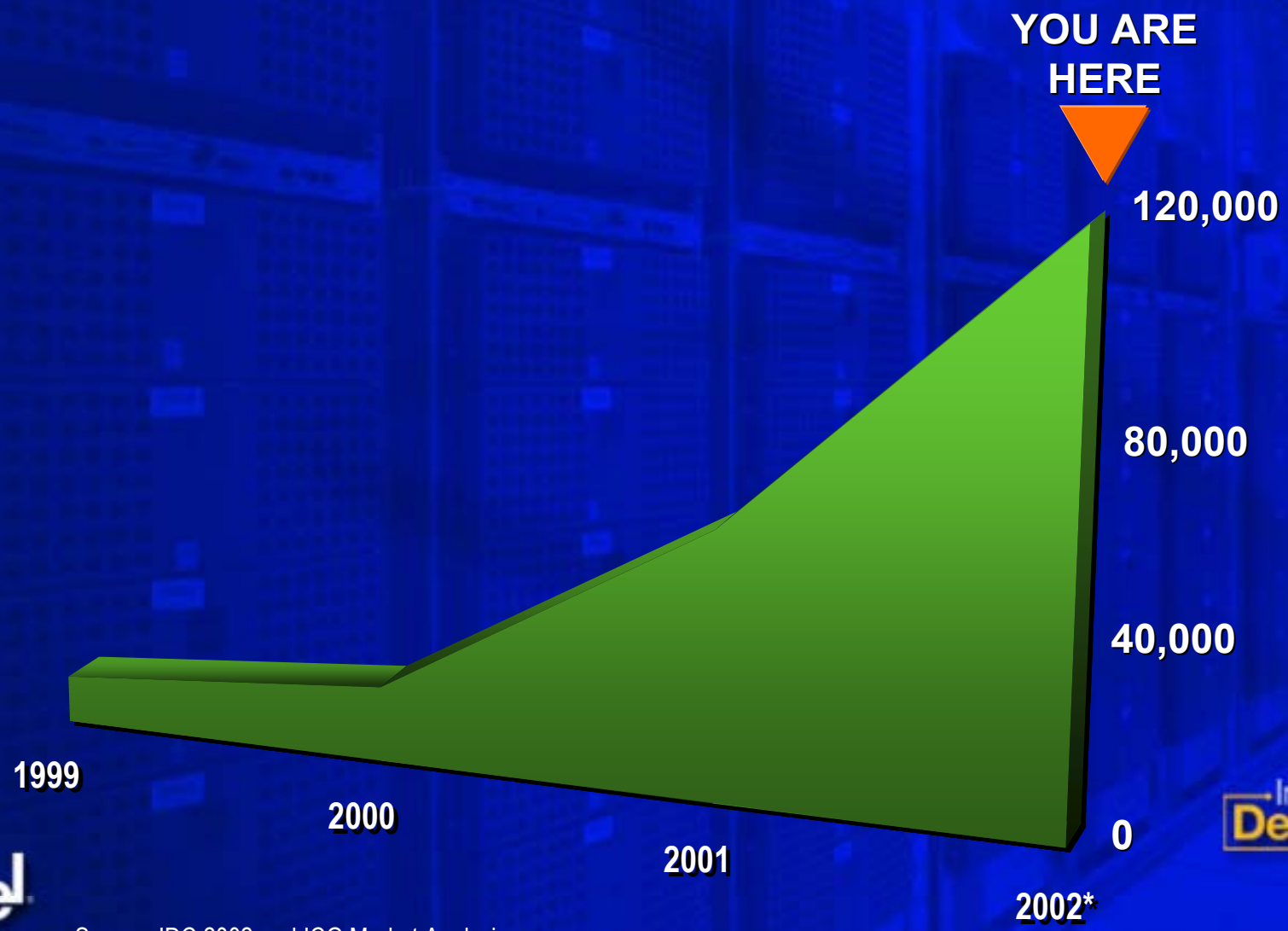
ETHERNET and OPTICAL

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Internet Growth in the Enterprise

Average Terabits per Day



Source: IDC 2002 and ICG Market Analysis

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Internet Growth in the Enterprise

Average Terabits per Day

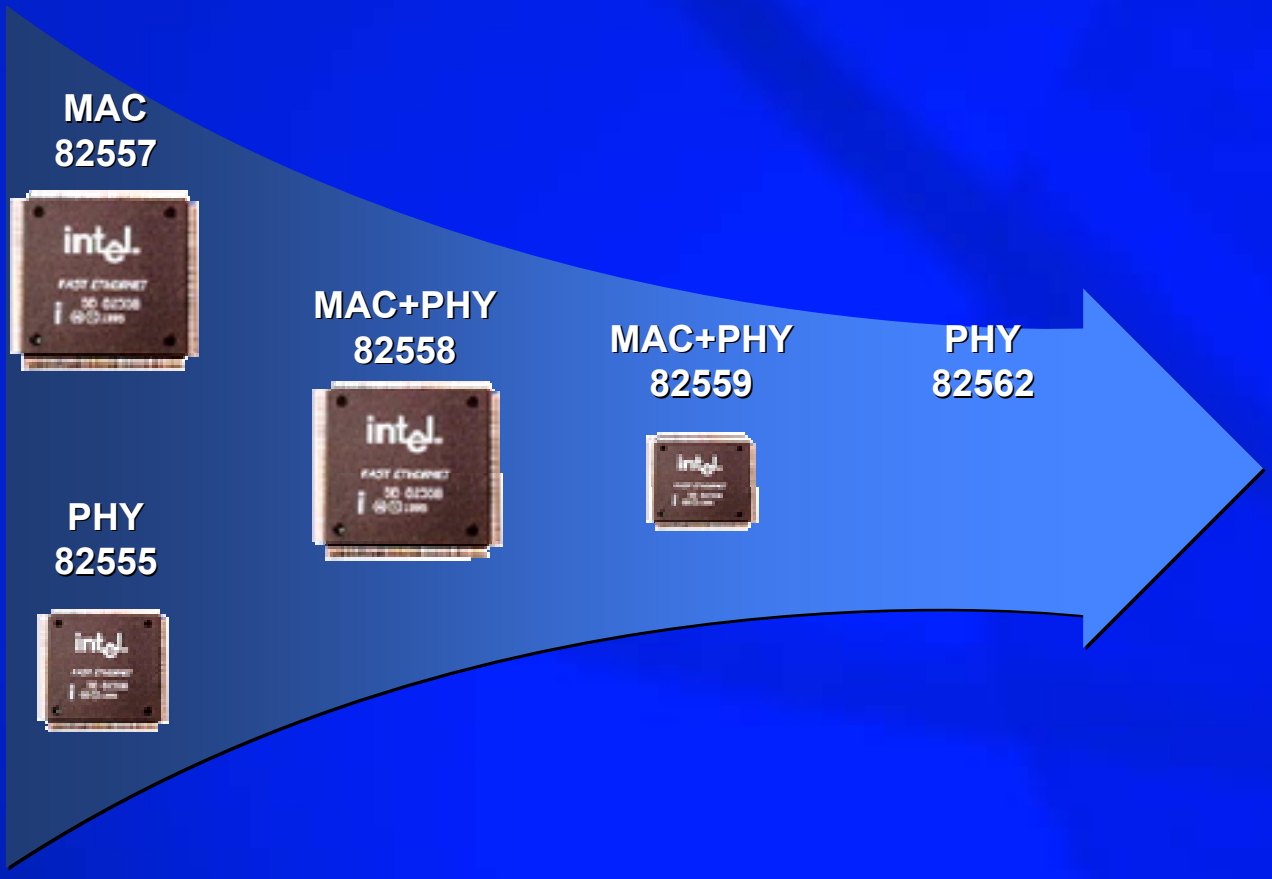


Source: IDC 2002 and ICG Market Analysis

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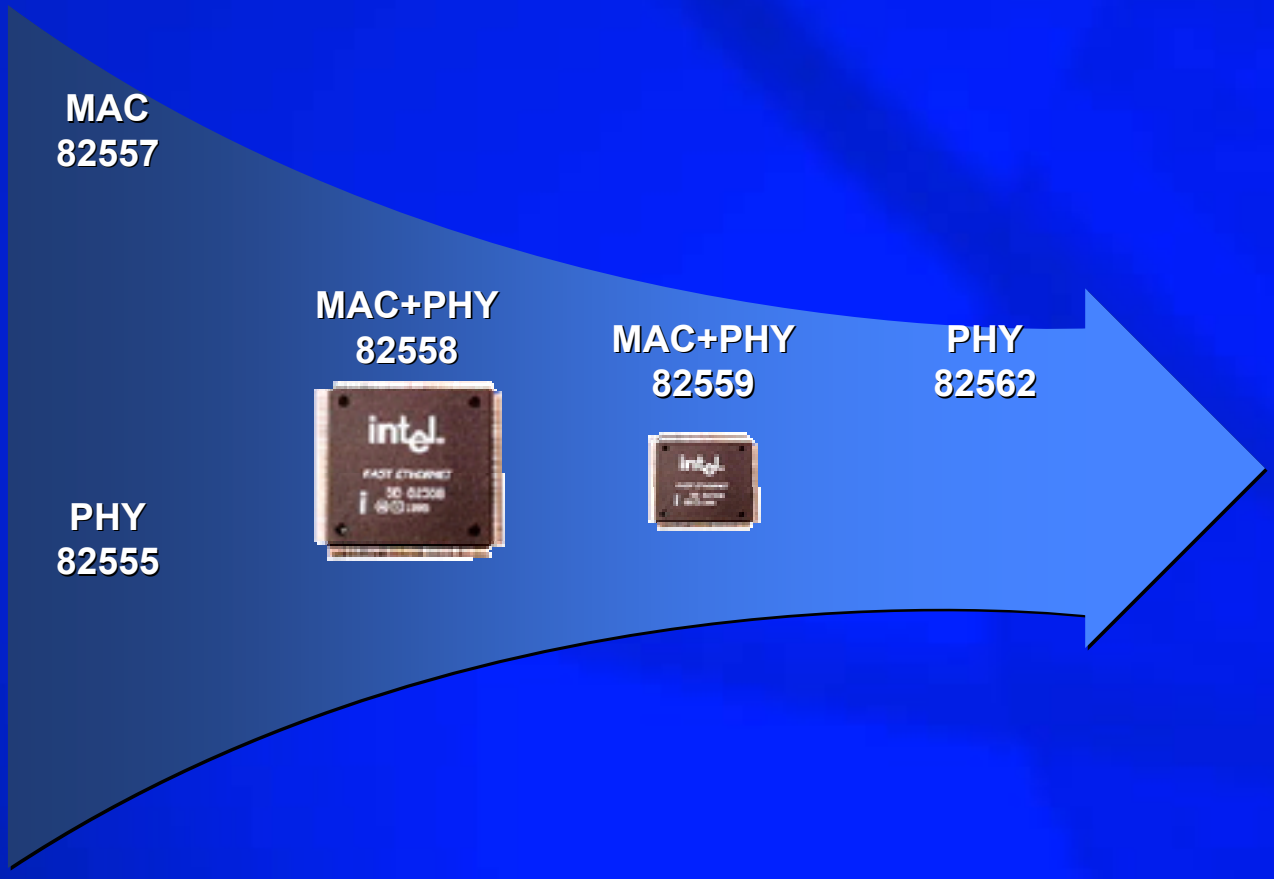
10/100 Evolution

Increasing Integration and Value

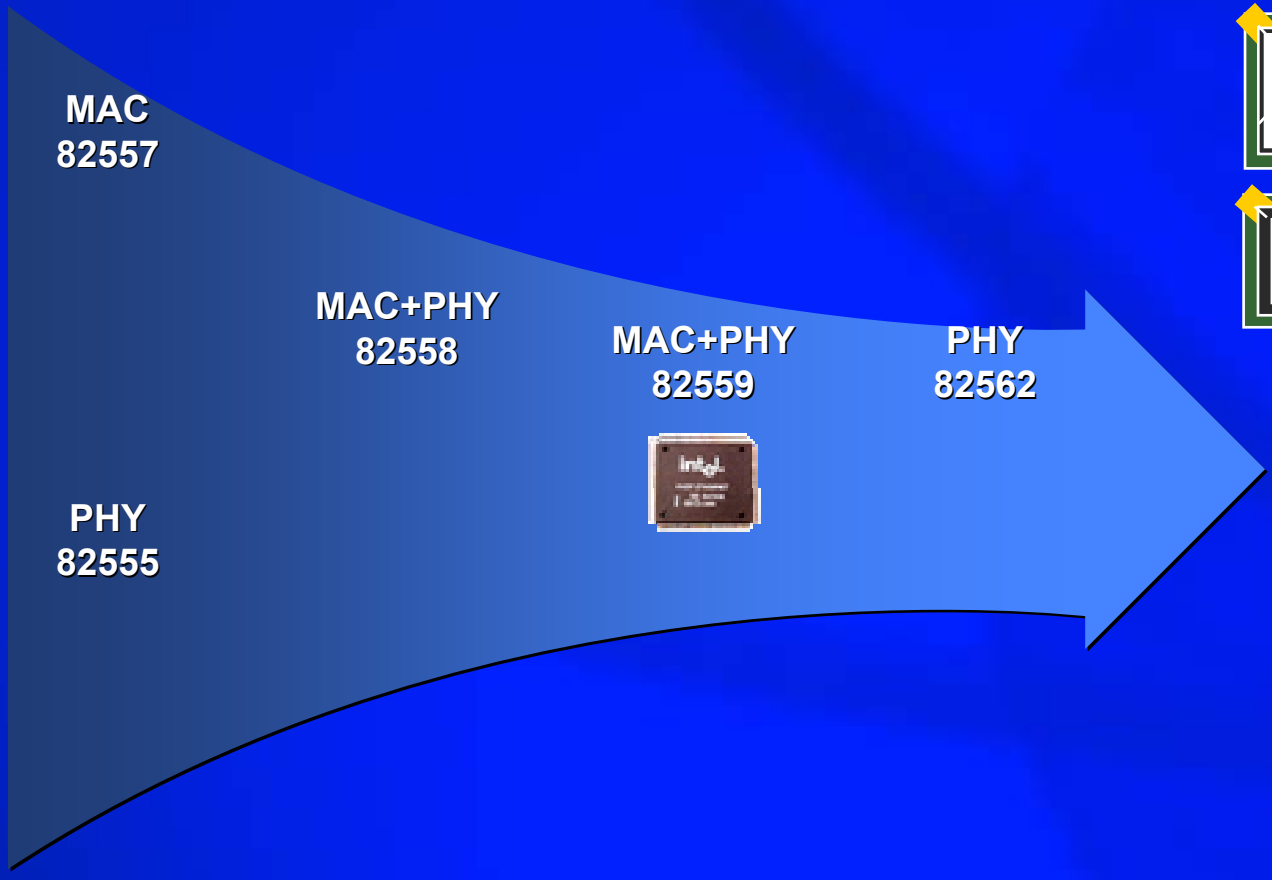


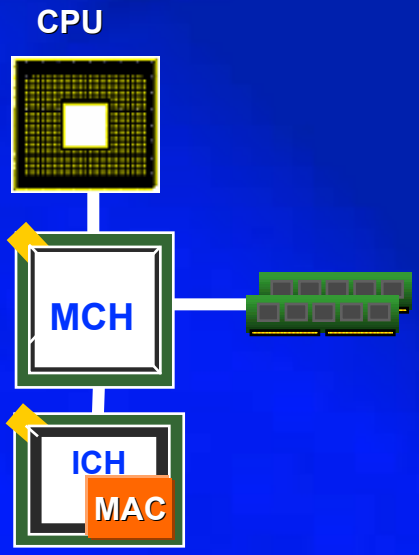
10/100 Evolution

Increasing Integration and Value

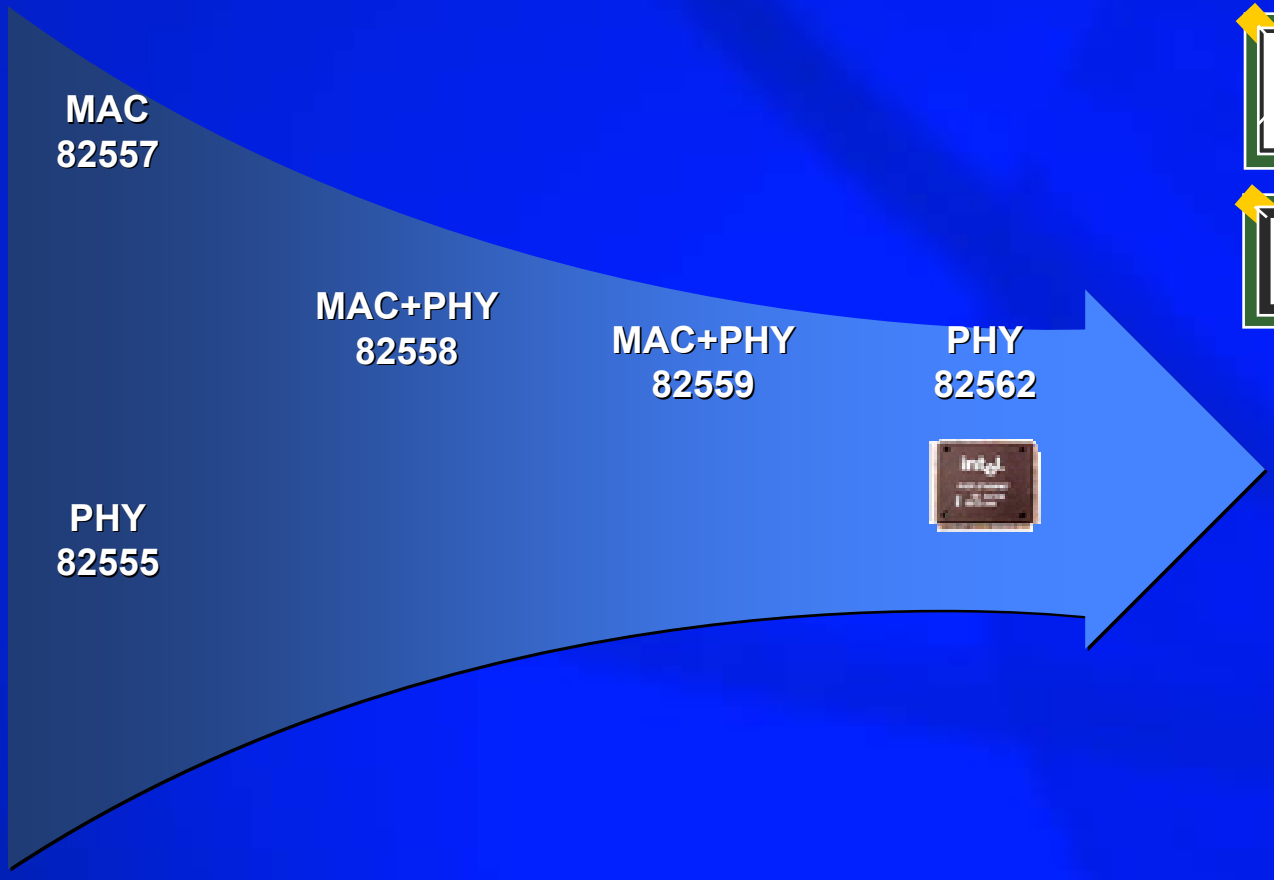


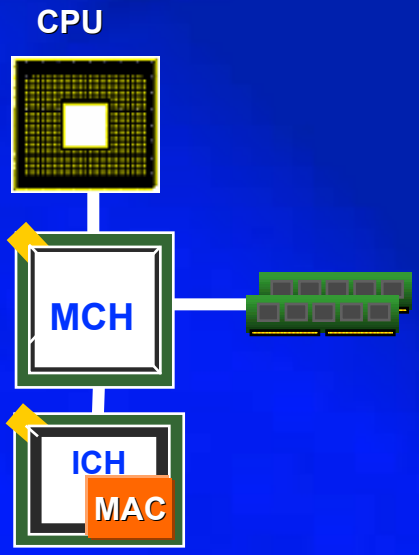
10/100 Evolution
Increasing Integration and Value



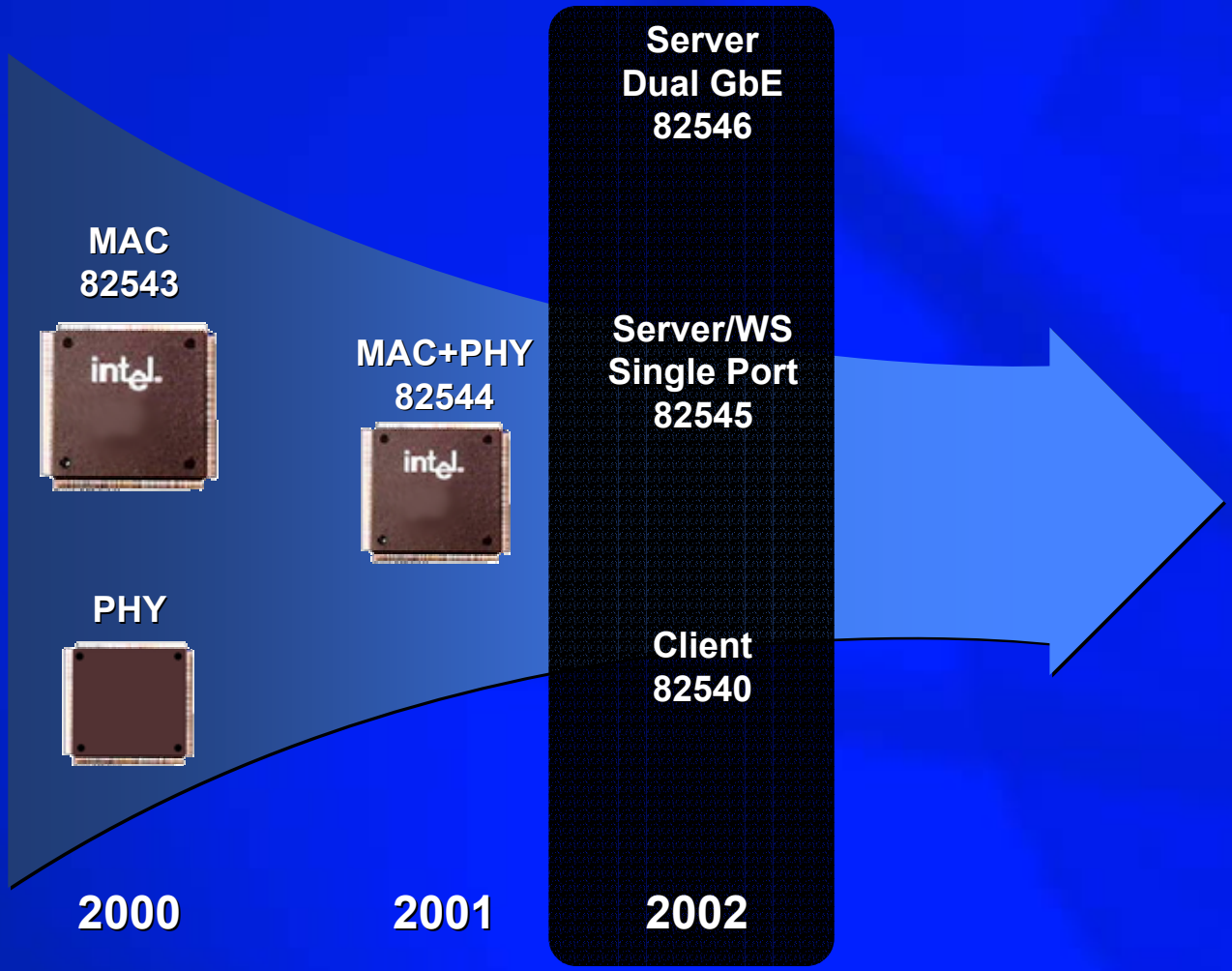


10/100 Evolution
Increasing Integration and Value

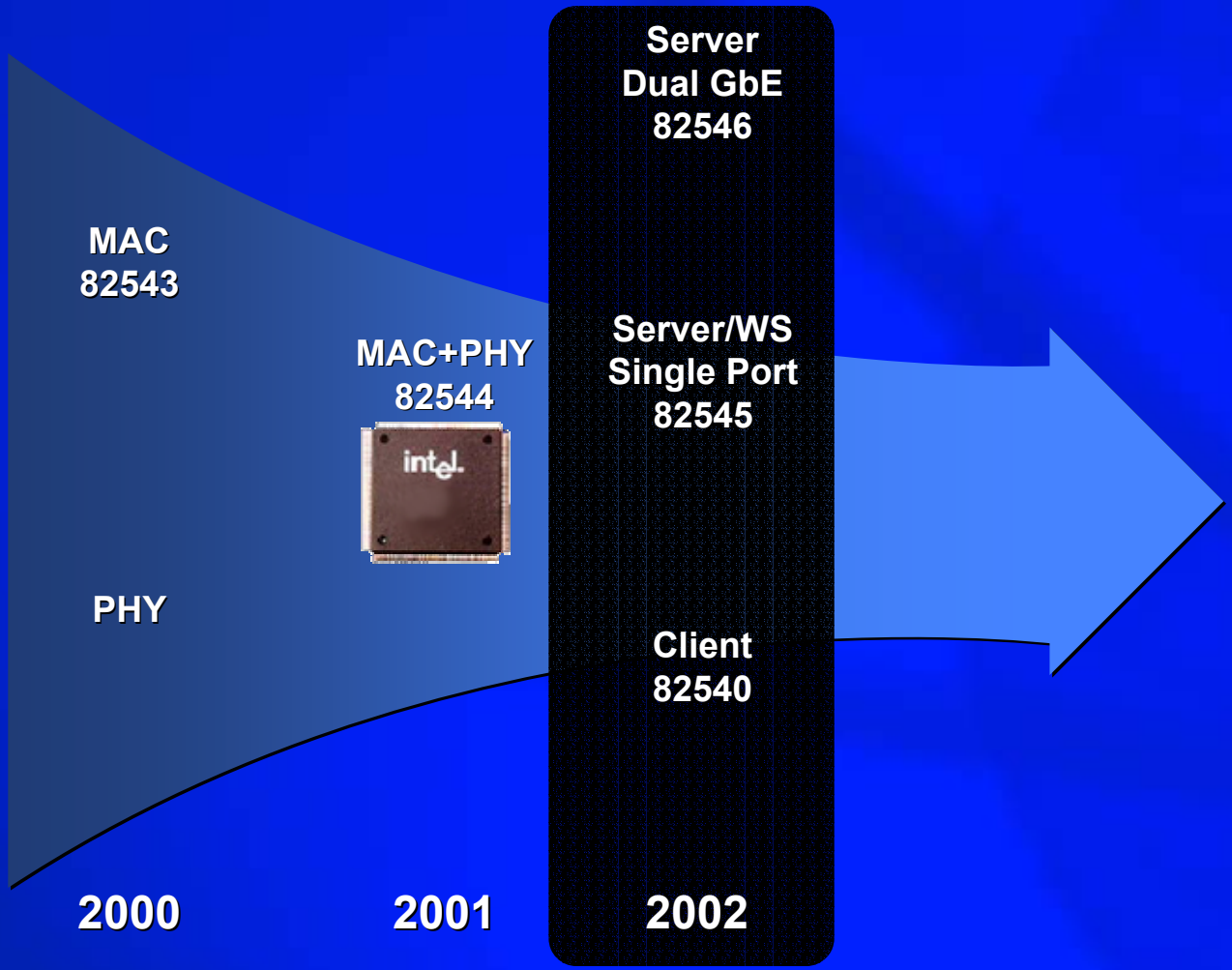




Post Recessionary Technology: Gigabit Ethernet

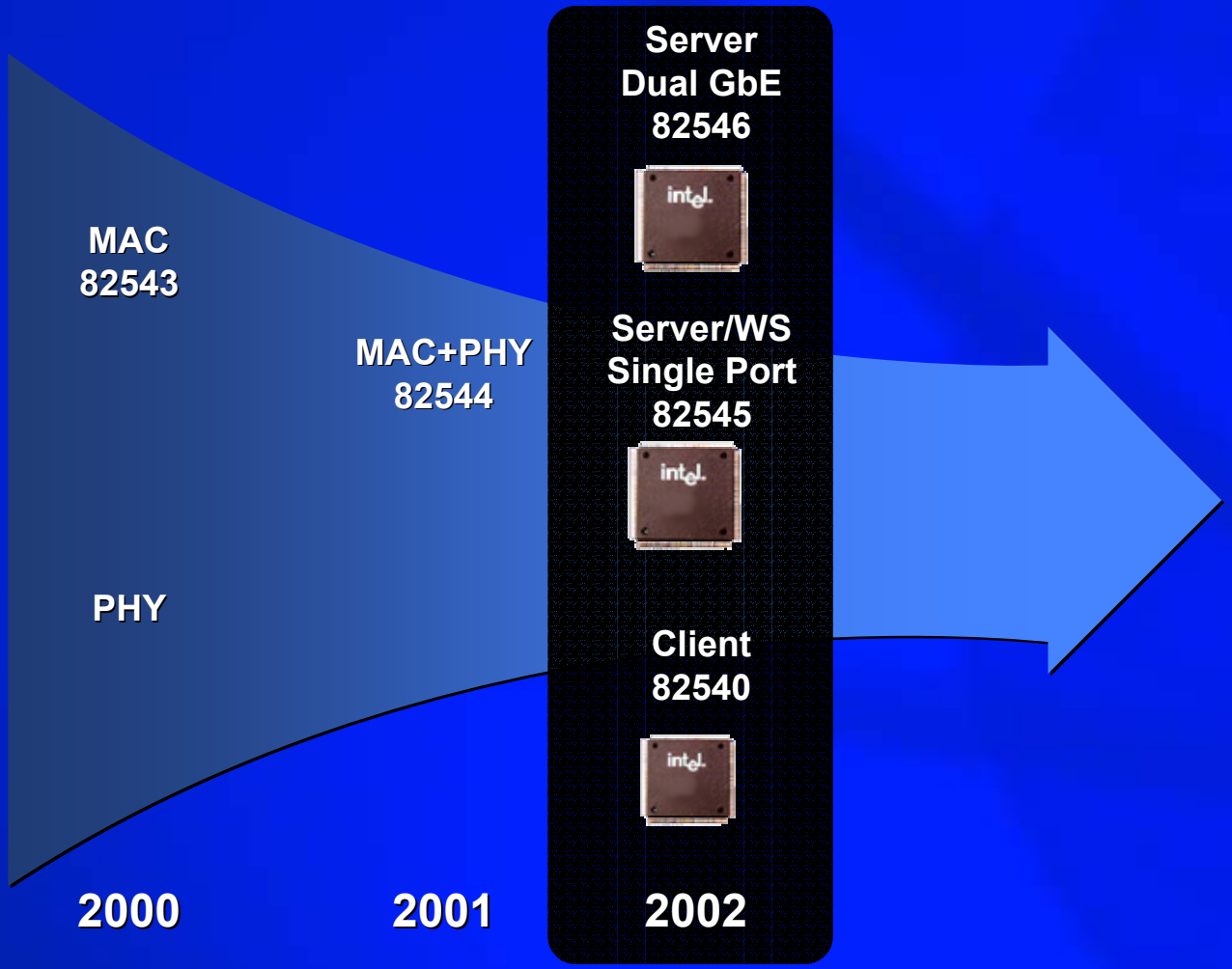


Post Recessionary Technology: Gigabit Ethernet



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Post Recessionary Technology: Gigabit Ethernet



Dual GbE
A Leap Forward...

Server
Dual GbE
82546





EASIER DESIGN

Footprint Compatible with Single GbE

Programmable LED Outputs (Link, Activity, Duplex…)

On Chip Power Control Circuitry

HIGHER PERFORMANCE

Port-Port Failover

Large Send Offload / TCP Segmentation

Interrupt Moderation

Scalable Up to 2Gbps

LOWERED COSTS

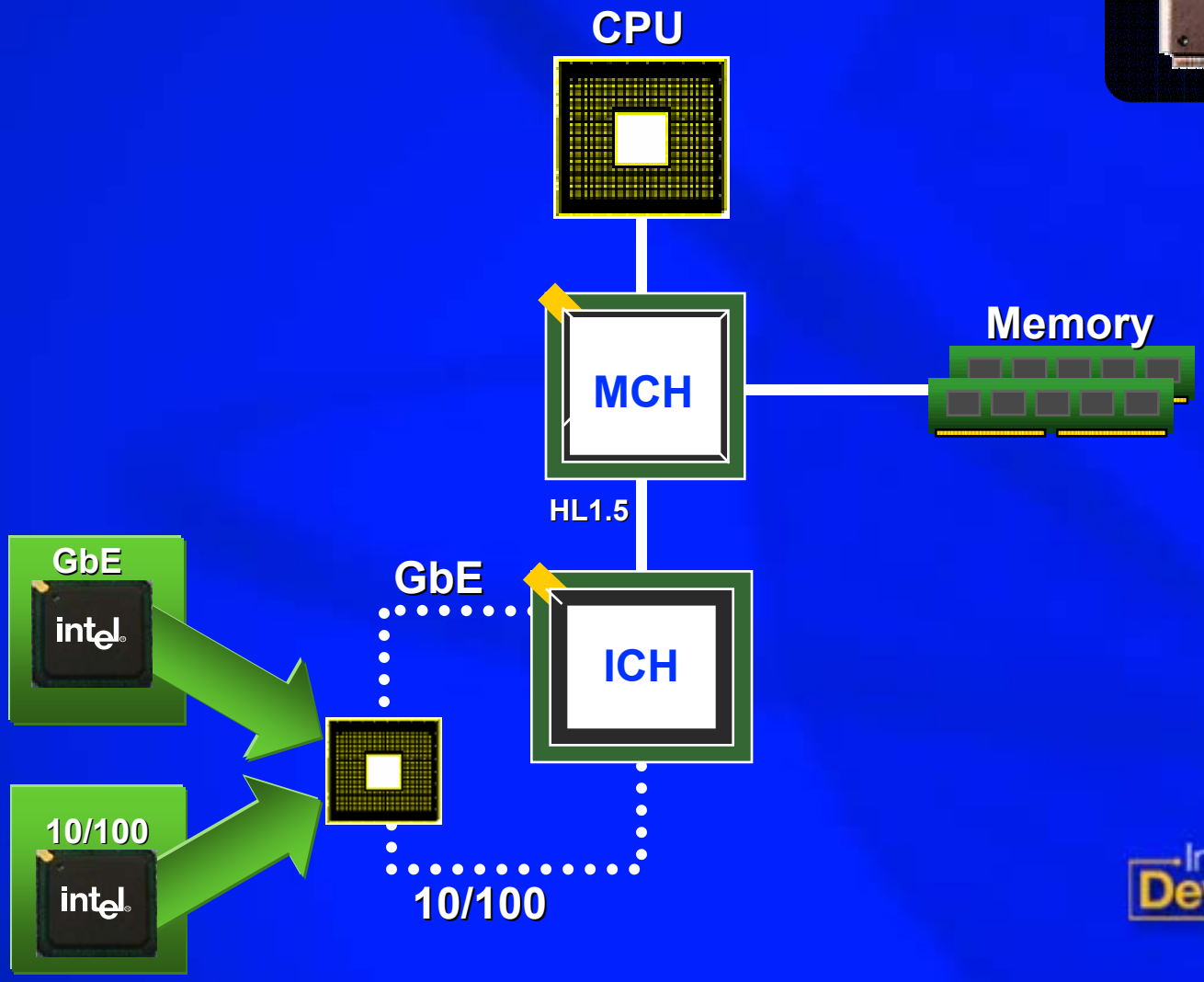
Cheaper Motherboard Design through Reduced Glue Logic

Lowest Power / Port:
1.75 Watts / Port

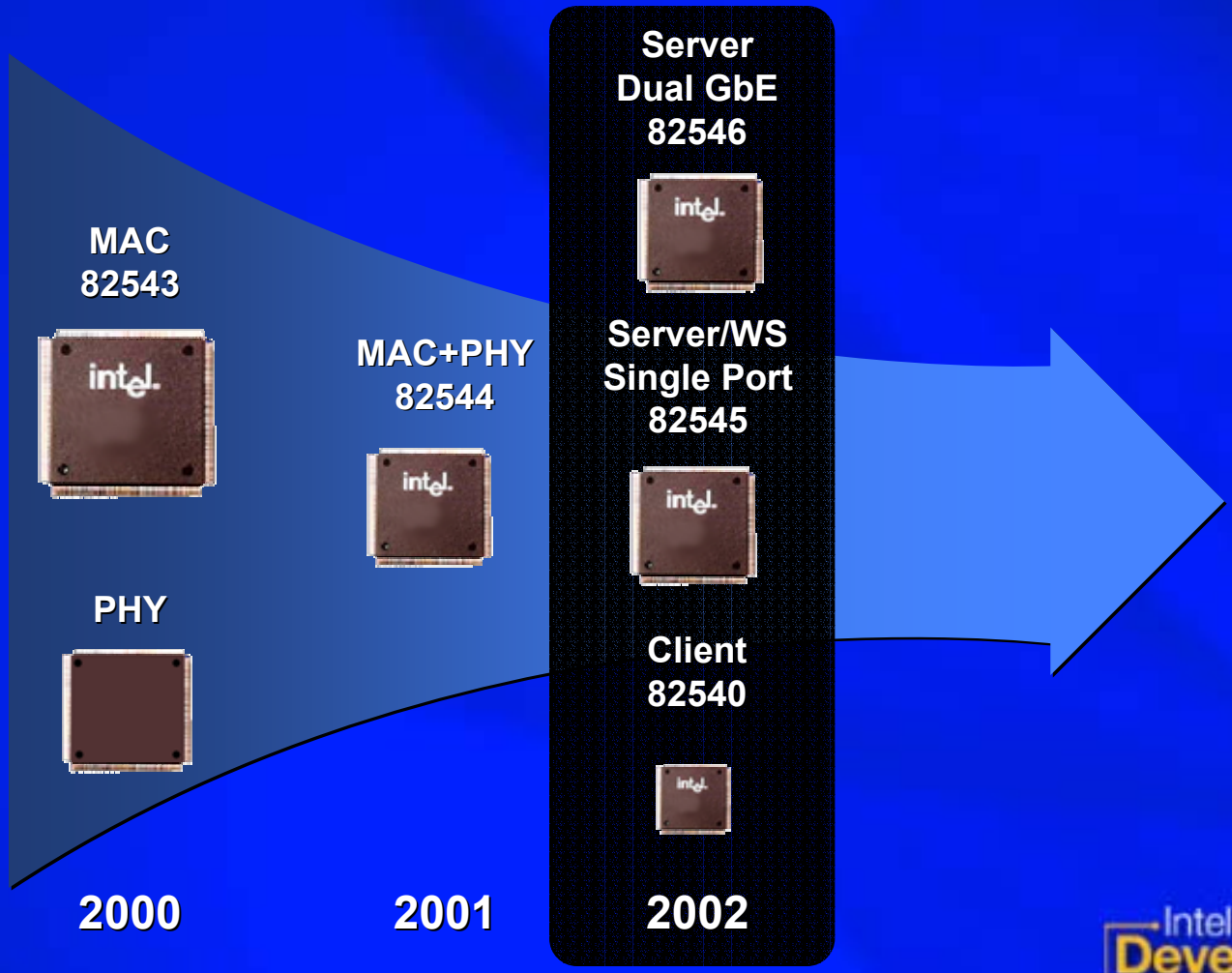
DEMO

10/100 and Gigabit Ethernet "Common Footprint" Motherboard Design

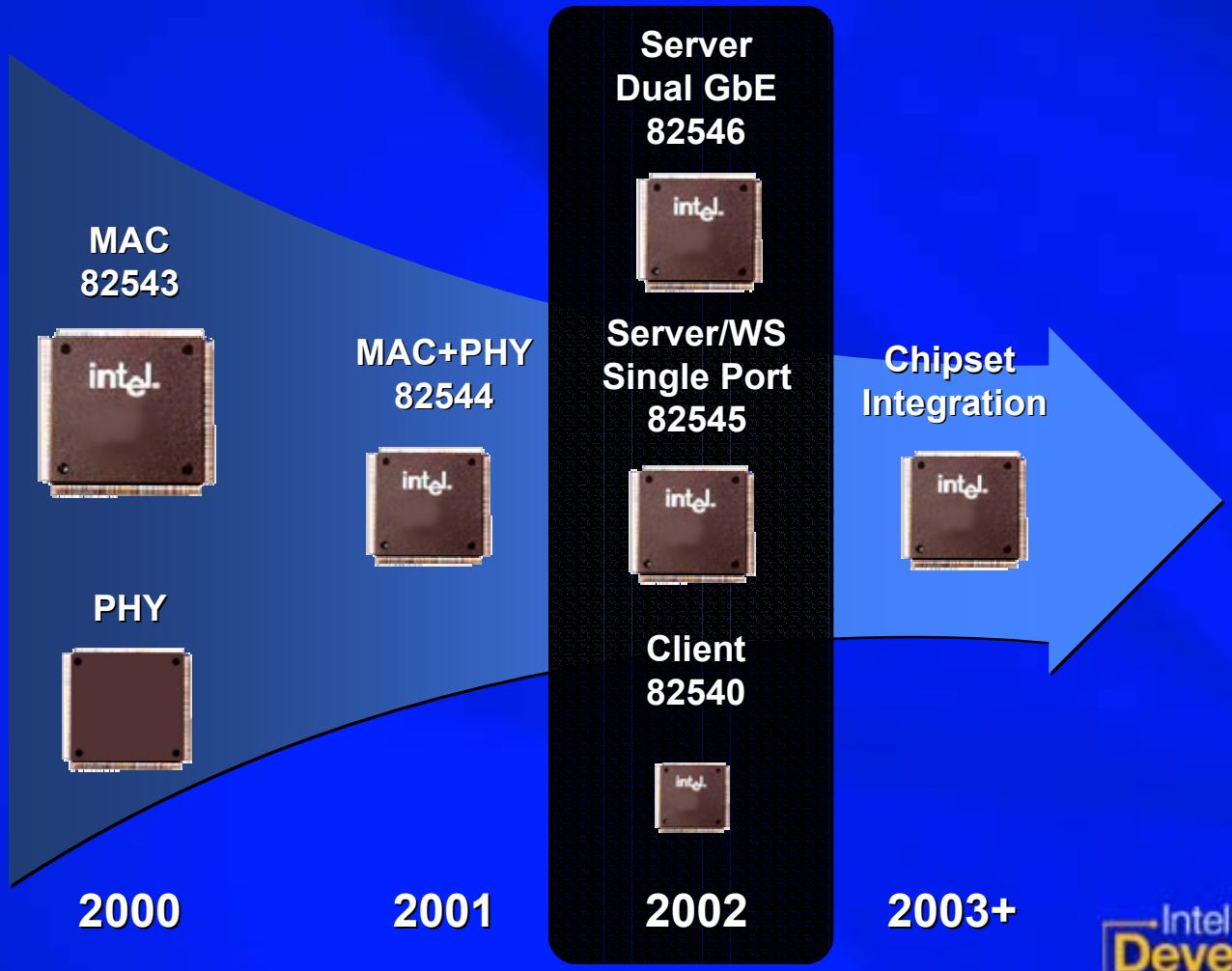




Post Recessionary Technology: Gigabit Ethernet



Post Recessionary Technology: Gigabit Ethernet



“ The advance of wireless data will also be a big deal in 2002…..”

– Business Week, December, 31 2001

“ Users want to be wirelessly connected throughout their home environment: on the couch, by the pool, (or) on the front porch.”

–Cahners In-Stat, ZDnet

802.11

“ Watch for the rise of home networking, PC and Net entertainment systems, and broadband”

– Business Week, December, 31 2001

“ 802.11 will wind up as the GPS of the next decade – a technology dreamed up for a limited purpose that mushrooms into a huge range of applications.”

– eWeek

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The Only Way is the Standards Way



IEEE

- Vice chair Quality of Service
- Editor / key cryptographer for Security
- Editor / founder for European enhancements

1394TA

- Chair of Wireless Working Group

Other standards

- Technical Chairs of PCMCIA, Mobile Advisory Council, 3GIO Communications group
- WECA Board of Directors
- Driving 802.11a standardization through ETSI

The Security Challenge

2000/2001

- Intel published first paper on the WEP issues
- Recommending VPNs as solution

INTEL

Editor of 802.11i Security

2002/2003

- Need low-cost, standards-based solutions to sustain growth
- Driving TKIP and AES through IEEE

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Deploying 802.11a in Europe

2000/2001

- 802.11a not easily deployed in Europe
- Europe 5 GHz regulatory requirements don't match 802.11a capabilities

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Co-founder and editor of TGh for 802.11a Europe features

Working with ETSI to determine rules for 802.11a in Europe

2002/2003

- New "harmonized standard" being developed for all WLANs by Q1'03
- Europe requirements being added to 802.11a
- 5 GHz products being sampled today in select European countries

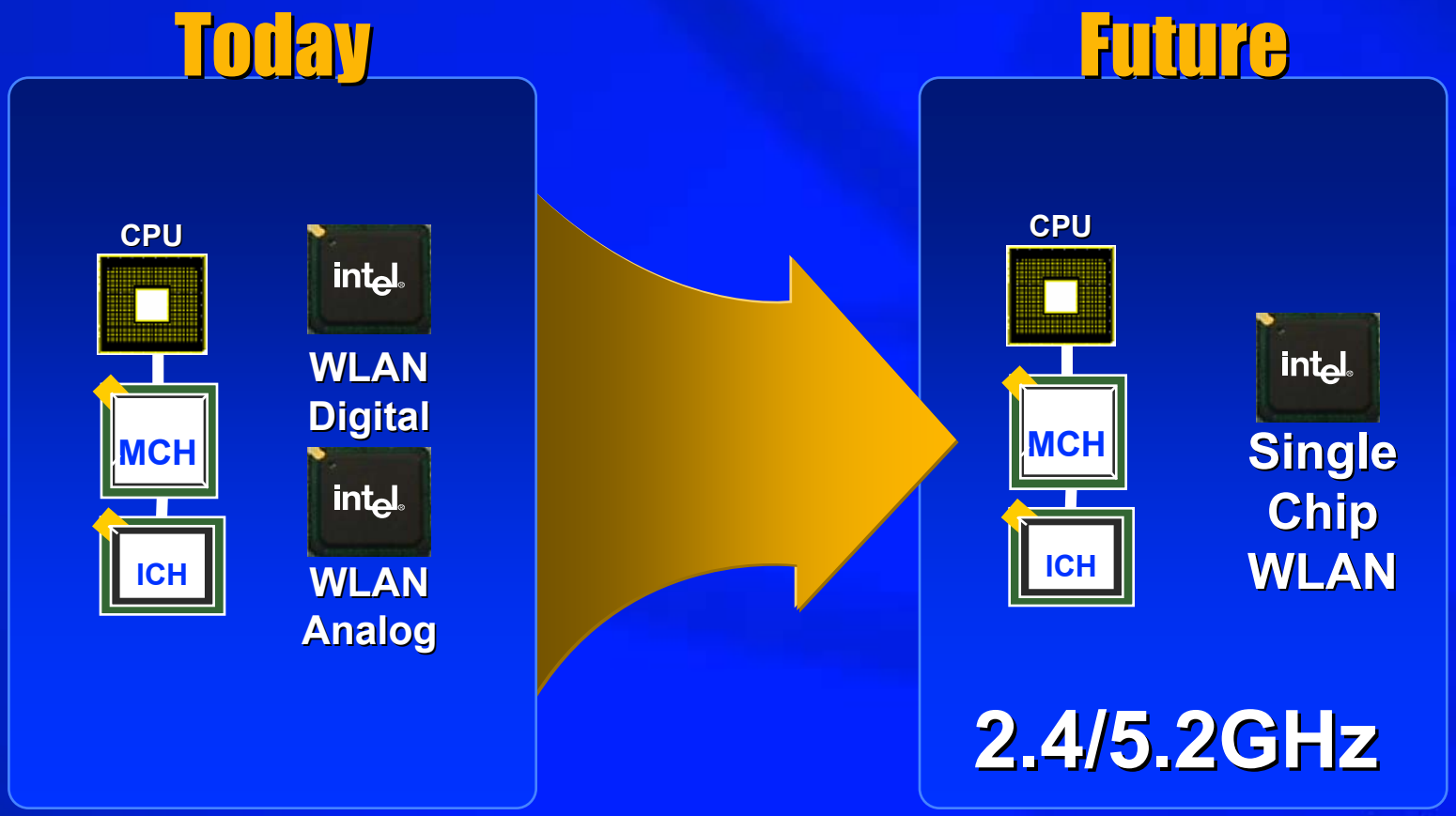
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Post Recessionary Technology: Dual Band 802.11b & a

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Wireless Integration



The Need for Speed

ETHERNET and OPTICAL

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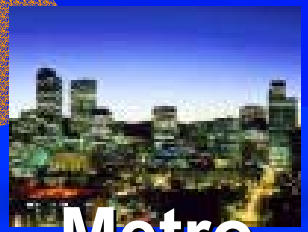
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10Gb Marches to the Enterprise



Long Haul

SONET 10/40G
Performance
Distance



Metro

SONET/10G E
Cost, Power, Density
Multi-transport, Reach



Enterprise

1G E and 10GE
Cost
Density

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Market Segment Requirements



Long-Haul



Metro



Enterprise

Reach

Cost

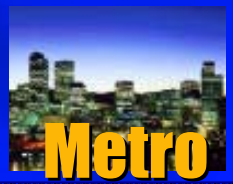
Power / Module

Port Density per Blade

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Market Segment Requirements







	Long-Haul	Metro	Enterprise
Reach	100 Km +	10 – 100 Km	< 2 Km
Cost			
Power / Module			
Port Density per Blade			

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Market Segment Requirements







	Long-Haul	Metro	Enterprise
Reach	100 Km +	10 – 100 Km	< 2 Km
Cost	$$$$	$$$	$$
Power / Module			
Port Density per Blade			

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Market Segment Requirements







	Long-Haul	Metro	Enterprise
Reach	100 Km +	10 – 100 Km	< 2 Km
Cost	$$$$	$$$	$$
Power / Module	12 Watts	5 Watts	< 2 Watts
Port Density per Blade			

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Market Segment Requirements

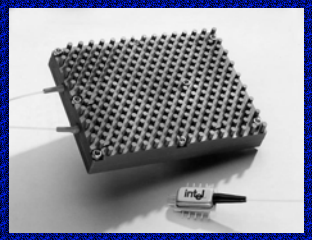






	Long-Haul	Metro	Enterprise
Reach	100 Km +	10 – 100 Km	< 2 Km
Cost	$$$$	$$$	$$
Power / Module	12 Watts	5 Watts	< 2 Watts
Port Density per Blade	1 port	4 – 8 ports	8 – 16 ports









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Post Recessionary Technology: 10Gigabit Ethernet



Long-Haul



Metro



Enterprise

Electronics

FEC

Lasers

Fiber Type

Packaging

Connectors

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Post Recessionary Technology: 10Gigabit Ethernet







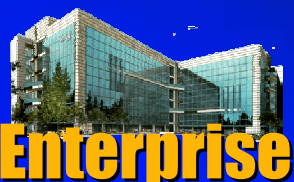
	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC			
Lasers			
Fiber Type			
Packaging			
Connectors			

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Post Recessionary Technology: 10Gigabit Ethernet







	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC	Required	Optional	N/A
Lasers			
Fiber Type			
Packaging			
Connectors			

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Post Recessionary Technology: 10Gigabit Ethernet







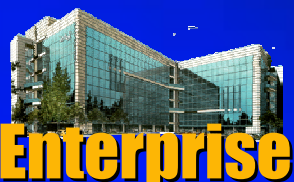
	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC	Required	Optional	N/A
Lasers	1550, DFB 1550 Tunable	1310, DFB 1550 Tunable	1310/850 FP/VCSEL
Fiber Type			
Packaging			
Connectors			

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Post Recessionary Technology: 10Gigabit Ethernet







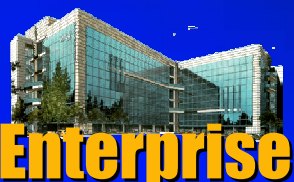
	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC	Required	Optional	N/A
Lasers	1550, DFB 1550 Tunable	1310, DFB 1550 Tunable	1310/850 FP/VCSEL
Fiber Type	SMF	SMF	SMF/MMF
Packaging			
Connectors			

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Post Recessionary Technology: 10Gigabit Ethernet







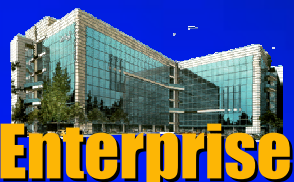
	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC	Required	Optional	N/A
Lasers	1550, DFB 1550 Tunable	1310, DFB 1550 Tunable	1310/850 FP/VCSEL
Fiber Type	SMF	SMF	SMF/MMF
Packaging	Hermetic Ceramic	Hermetic Ceramic	Non-Hermetic Plastic
Connectors			

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Post Recessionary Technology: 10Gigabit Ethernet







	Long-Haul	Metro	Enterprise
Electronics	GaAs, SiGe, Si-Bipolar	SiGe, CMOS	CMOS, SiGe
FEC	Required	Optional	N/A
Lasers	1550, DFB 1550 Tunable	1310, DFB 1550 Tunable	1310/850 FP/VCSEL
Fiber Type	SMF	SMF	SMF/MMF
Packaging	Hermetic Ceramic	Hermetic Ceramic	Non-Hermetic Plastic
Connectors	Discrete	Pluggable Transponders	Pluggable Transponders

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Post Recessionary Technology: Network Processing

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